THE INVENTION CLAIMED IS:

1. A method of hierarchical scheduling comprising:

receiving data from one or more pipes, each pipe including a plurality of pipe flows;

selecting a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe;

selecting a pipe flow from the plurality of pipe flows included in the winning pipe based upon one or more quality of service parameters corresponding to the selected pipe flow; and

transmitting data from the selected pipe flow.

2. The method of claim 1 wherein transmitting data from the selected pipe flow includes transmitting data from the selected pipe flow using a bandwidth corresponding to the winning pipe flow.

3. The method of claim 1 wherein selecting a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe includes writing data identifying a pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe and scanning the group of memory addresses to find data identifying a pipe.

4. The method of claim 3 further comprising rewriting data identifying the winning pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the winning pipe.

5. The method of claim 1 wherein selecting a pipe flow from the plurality of pipe flows included in the winning pipe, based upon one or more quality of service parameters corresponding to the selected pipe flow, includes:

writing data identifying a pipe flow to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe flow;

scanning the group of memory addresses to find data identifying a pipe flow;

writing the identified pipe flow in a queue corresponding to the winning pipe based upon one or more quality of service parameters corresponding to the selected pipe flow; and

selecting the identified pipe flow from the queue corresponding to the winning pipe.

6. The method of claim 5 further comprising writing data identifying the selected pipe flow to a memory address in a group of memory addresses, based upon one or more quality of service parameters corresponding to the selected pipe flow.

7. A method for hierarchical scheduling comprising:

receiving data identifying a pipe flow, the pipe flow included in a pipe;

writing data regarding the pipe to a first calendar;

writing data regarding the pipe flow to a second calendar;

scanning the first calendar for a winning pipe;

scanning the second calendar for a winning pipe flow;

writing the winning pipe flow to a corresponding pipe queue;

using the winning pipe to select a pipe flow from a corresponding pipe queue; and

transmitting data from the selected pipe flow.

8. The method of claim 7 further comprising rewriting data regarding the winning pipe flow to the second calendar.

9. The method of claim 7 further comprising rewriting data regarding the winning pipe to the first calendar.

10. A network processor comprising:

at least one memory adapted to store one or more quality of service parameters corresponding to one or more pipes and pipe flows; and

scheduler logic, coupled to the at least one memory, adapted to:

receive data from one or more pipes, each pipe including a plurality of pipe flows;

select a winning pipe from the one or more pipes from which to transmit data based upon one or more quality of service parameters corresponding to the winning pipe;

select a pipe flow from the plurality of pipe flows included in the winning pipe based upon one or more quality of service parameters corresponding to the selected pipe flow; and

transmit data from the selected pipe flow.

11. The network processor of claim 10 wherein the scheduler logic comprises:

a primary calendar for storing at least one of an autonomous flows and a pipe that are scheduled to be serviced;

a secondary calendar for storing pipe flows that are scheduled to be serviced; and

a pipe queue table for storing a winning pipe flow in a queue for a pipe to which the pipe flow corresponds.

12. The network processor of claim 11 wherein the scheduler logic further comprises:

enqueue and new attach logic for scheduling at least one of an autonomous flow and a pipe flow to be serviced; and

dequeue and reattach logic for selecting at least one of an autonomous flow and a pipe flow to be serviced.

13. The network processor of claim 10 wherein the scheduler logic is further adapted to transmit data from the selected pipe flow using a bandwidth corresponding to the winning pipe flow.

14. The network processor of claim 10 wherein the scheduler logic is further adapted to write data identifying a pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe and scanning the group of memory addresses to find data identifying a pipe.

15. The network processor of claim 14 wherein the scheduler logic is further adapted to rewrite data identifying the winning pipe to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the winning pipe.

16. The network processor of claim 10 wherein the scheduler logic is further adapted to:

write data identifying a pipe flow to a memory address in a group of memory addresses based upon one or more quality of service parameters corresponding to the pipe flow;

scan the group of memory addresses to find data identifying a pipe flow;

write the identified pipe flow in a queue corresponding to the winning pipe based upon one or more quality of service parameters corresponding to the selected pipe flow; and

select the identified pipe flow from the queue corresponding to the winning pipe.

17. The network processor of claim 16 wherein the scheduler logic is further adapted to write data identifying the selected pipe flow to a memory address in a group of memory addresses, based upon one or more quality of service parameters corresponding to the selected pipe flow.

18. A network processor comprising:

at least one memory adapted to store one or more quality of service parameters corresponding to one or more pipes and pipe flows; and

scheduler logic comprising a first calendar and a second calendar, coupled to the at least one memory and adapted to:

receive data identifying a pipe flow, the pipe flow included in a pipe;

write data regarding the pipe to the first calendar;

write data regarding the pipe flow to the second calendar;

scan the first calendar for a winning pipe;

scan the second calendar for a winning pipe flow;

write the winning pipe flow to a corresponding pipe queue;

use the winning pipe to select a pipe flow from a corresponding pipe queue; and

transmit data from the selected pipe flow.

19. The network processor of claim 18 wherein the scheduler logic further comprises:

a pipe queue table for storing a winning pipe flow in a queue for a pipe to which the pipe flow corresponds;

an enqueue and new attach logic for scheduling at least one of an autonomous flow and a pipe flows to be serviced; and

a dequeue and reattach logic for selecting at least one of an autonomous flow and a pipe flow to be serviced.

20. The network processor of claim 18 wherein the scheduler logic is further adapted to rewrite data regarding the winning pipe flow to the second calendar.

21. The network processor of claim 18 wherein the scheduler logic is further adapted to rewrite data regarding the winning pipe to the first calendar.